

REMARKS

Applicants thank the Examiner for conducting the May 10, 2005 personal interview with Applicants' representative regarding the instant Application. At the interview, Applicants' representative and the Examiner discussed the primary reference applied against the pending claims of this application, *Masuda et al.* (US 6,340,999). Applicants' representative pointed out that *Masuda et al.* was specifically directed to a device with an air gap separating front light 1 and liquid crystal portion 5 (see, e.g., FIG. 10 of *Masuda et al.*), and thus that the portions cited by the Examiner as being part of a single "substrate," glass substrate 5a and light guide 3, were physically separate, and not reasonably interpreted as a single "substrate." These points are more fully discussed below (along with other relevant arguments). It is Applicants' representative's understanding that the Examiner agreed to withdraw the current claim rejections based on *Masuda et al.*, and to conduct a further search for any relevant art.

Status of the Application

Claims 1-44 are all the claims pending in the Application, as claims 20-44 are hereby added. Claims 1-19 stand rejected.

Provisional Rejections Under Obviousness-Type Double Patenting

The Examiner has again provisionally rejected claim 1 under the judicially created doctrine of obviousness-type double patenting as being unpatentable over: (1) claims 1-8 of co-pending application 09/898,060; (2) claims 1-9 of co-pending application 09/833,941; (3) claims 1-22 of co-pending application no. 09/878,268; and (4) claims 1-38 of co-pending application 10/225,532.

09/898,060, 09/878,268 and 10/255,532 remain pending as of the date of this Amendment. Thus, Applicants defer further comment regarding the provisional rejections based on these references.

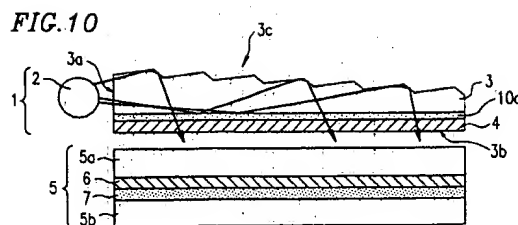
09/883,941 was patented on March 23, 2004 as U.S. Patent 6,710,840. Thus, the Examiner's obviousness-type double patenting rejection should no longer be provisional. However, Applicants respectfully submit that a review of the patented claims of 09/883,941 reveals no teaching or suggestion (or even a consideration) therein of, *inter alia*, any particular angular relationship of optical path changing slopes, such as is recited in independent claim 1. Thus, Applicants respectfully submit that claim 1 of the instant Application cannot reasonably be read as being obvious in view of claims 1-9 of 09/833,941, and respectfully request the withdrawal of this rejection.

Claim Rejections

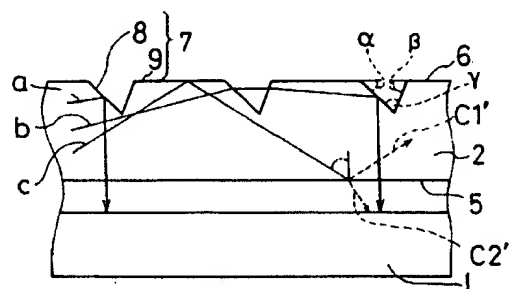
The Examiner has rejected, under 35 U.S.C. § 103(a): (1) claims 1-8 and 12-14 as being unpatentable over *Masuda et al.* (US 6,340,999; hereinafter "*Masuda*") in view of *Egawa et al.* (US 6,295,104 B1; hereinafter "*Egawa*"); (2) claims 13 and 14 as being unpatentable over *Masuda* in view of *Egawa* and *Evanicky et al.* (US 6,243,068 B1; hereinafter "*Evanicky*"); (3) claims 9-11 and 15-17 as being unpatentable over *Masuda* in view of *Egawa* and *Yano et al.* (JP 11-326903; hereinafter "*Yano*"); and (4) claims 18 and 19 as being unpatentable over *Masuda* in view of *Egawa* and *Nemoto et al.* (US 6,456,344; hereinafter "*Nemoto*"). These rejections are respectfully traversed.

(A) The Applied References

Masuda (see FIG. 10 reproduced to the right) discloses a reflective type liquid crystal display 5, consisting of glass substrate 5a, liquid crystal layer 6, reflector 7, and glass substrate 5b. A separate front light 1 consisting of a light guide 3, low refractive resin layer 10a, and a polarization selecting section 4 is arranged above glass substrate 5. Front light 1 is not part of reflective type liquid crystal display 5, but rather is separated therefrom by an air gap.



Egawa discloses (see FIG. 3 reproduced to the right) an illumination apparatus having a liquid crystal light element L, a transparent member 11, a transparent substrate 2 with triangular grooves 8, and a light source 4 (see FIG. 2). *Egawa* indicates that



the transparent member 11 has an equal or lower refractive index than transparent substrate 2, to improve the reflective properties of the apparatus (col. 5, line 40 - col. 6, line 22).

Thus, both *Masuda* and *Egawa* disclose reflective LCD structures where a front light section (1 in *Masuda* and 2 in *Egawa*) is arranged in front of a liquid crystal section (5 in *Masuda* and L in *Egawa*). However, the actual configurations of *Masuda* and *Egawa* are quite different.

Specifically, *Masuda* is directed to a particular type of front light LCD that has a front light 1 that: (1) is separated from the liquid crystal display 5 by an air gap; and (2) reduces in thickness as it extends away from a light source 2. In contrast, *Egawa* is directed to a system

that has a front substrate 2 that is: (1) connected to a liquid crystal element L by an transparent member 11; and (2) of a constant thickness as it extends away from a light source 2.

(B) The Examiner's Position

The Examiner alleges that *Masuda* discloses all of the features of independent claim 1, except that it fails to “explicitly teach in the text that [the] angle of slopes illustrated in Figure 10 [is] within the range of 35 to 48 degrees” (O.A., pg. 8, lines 1-2). In an attempt to show that such features were known, the Examiner cites col. 8, lines 28-33 *Egawa*, which discloses that angles α of consecutive grooves 8 (see FIG. 3) may be varied from 48° to 52° to 46° . Further, the Examiner alleges that *Egawa* “is evidence that ordinary workers in the art of liquid crystals would find the reason, suggestion, or motivation to add an angle of slope of 38 to 44 degrees to improve .. display performance,” and that it would therefore be obvious to modify *Masuda* in view of *Egawa*.

Applicants respectfully disagree, and submit that: (1) one of ordinary skill in the art at the time of the invention (“one of skill”) would not have been motivated to modify *Masuda* in view of *Egawa* as the Examiner alleges; and (2) even the alleged combination of *Masuda* and *Egawa* fails to teach or suggest many of the features recited in independent claim 1.

(C) There Would Have Been No Motivation to Modify Masuda In View of Egawa

As discussed above, *Masuda* and *Egawa* are directed to front light LCDs of different construction. *Masuda* discloses a front light 1 that decreases in thickness as it extends from light source 2, and which has a series of “periodic concave and convex portions 3f formed at a predetermined pitch in the shape of a prism, [each with] a propagation portion 3d and a reflection portion 3e” (col. 10, line 65 - col. 11, line 8). Further, *Masuda* discloses a specific relationship

between the lengths of the propagation portions 3d and the reflections portions 3e, in this case, 370 μm to 20 μm , respectively. This configuration helps direct light generally downward toward the liquid crystal display 5. In contrast, *Egawa* is directed to a front light 2 that is of a constant thickness as it extends from its light source 4. Further, *Egawa* does not provide repeating convex and concave portions, but rather provides repeating grooves 8.

The Examiner alleges that one of skill would have been motivated to modify the periodic concave and convex portions 3f of the reducing thickness light guide 3 of *Masuda* to incorporate the specific angular relationships of the grooves of *Egawa*. Applicants disagree.

Masuda does not utilize grooves that are at all similar to those of *Egawa*. Rather, *Masuda* provides repeating convex and concave portions with a specific length interrelationship to provide internal reflection for its light guide 3. There is no teaching or suggestion (or even any reason to believe) that the modification of the specific length interrelationship disclosed in *Masuda* to incorporate the angular relationship of grooves of *Egawa* would provide anything other than a deleterious result.

Specifically, the Examiner has not cited any reason why one of skill would have made such a modification. There is no teaching or suggestion of any deficiency that would require such a modification in *Masuda*, and *Egawa* is equally silent regarding any such deficiency, as it is directed to a different kind of reflection system (a constant thickness grooved transparent substrate 2).¹

¹ The Examiner must “show reasons that the skilled artisan, confronted with the same problems as the inventor and with no knowledge of the claimed invention, would select the elements from the cited prior art references for a combination in the manner claimed.” *In re Rouffet*, 47 USPQ2d 1453 (Fed.Cir. 1998). The mere fact that references can be “combined or modified does not render the
... (footnote continued)

Accordingly, Applicants respectfully submit that one of skill would not have modified the specific construction of Masuda to provide the grooves of *Egawa*.

(D) The Examiner's Identification of Multiple Discrete Layers Separated By Gaps As A Single "Substrate" Is Unreasonable

Claim 1 recites a "visual side substrate" which includes a "transparent substrate" (e.g., element 21 in FIG. 1), a "low refractive index transparent layer" (e.g., element 22 in FIG. 1) and a transparent electrode (e.g., element 24 in FIG. 1). As can be easily seen in FIG. 1 of the Application, each of the exemplary elements 21, 22 and 24 are arranged in directly stacked layers, i.e., there are no open spaces or voids arranged between these layers. This is consistent with the definition of "substrate" normally used in the relevant art.

The Examiner alleges that the recited: (1) "visual side substrate" is equivalent to *Masuda's* glass substrate 5a; (2) "transparent substrate" is equivalent to *Masuda's* light guide 3; and (3) "low refractive index transparent layer" is equivalent to *Masuda's* low refractive resin layer 10a. Applicants disagree.

Applicants respectfully submit that the Examiner's allegation that the separate light guide 3 and glass substrate 5a of *Masuda* somehow constitute a single "substrate" is both unreasonable and unsupported by *Masuda*. The Examiner has failed to explain why he thinks such separate pieces can form a single "substrate," or to cite a single example of a LCD arrangement that classifies discrete layers that are physically separated by an intervening gap as a single

resultant combination [or modification] obvious unless the prior art also suggests the desirability of the combination [or modification]." *In re Mills*, 916 F.2d 680 (Fed.Cir. 1990); MPEP §2143.01.

“substrate.” In fact, Appellant respectfully submits that the only reasonable reading of *Masuda* is that only glass substrate 5a corresponds to the recited “visual-side substrate.”

(E) The Examiner’s Identification of A Single Element of Masuda As Both The Recited “Visual Side Substrate” and “Optical Path Control Layer” Is Unreasonable

Claim 1 recites “an optical path control layer” (e.g., element 11 in FIG. 1) “on an outer side of said visual-side substrate” (e.g., a combination of elements 21, 22 and 24). FIG. 1 of the Application shows an example of such an arrangement, where element 11 is a discrete “layer” arranged “on” the “visual-side substrate” (supported by intervening layers 12 and 13). This is consistent with the definition of “layer” normally used in the relevant art.

The Examiner alleges that the recited “optical path control layer” is equivalent to upper surface 3c of light guide 3.

However, Applicants respectfully submit that the Examiner’s allegation that upper surface 3c of *Masuda* corresponds to the “optical path control layer” and is somehow different from the light guide 3 itself, is both unreasonable and unsupported by *Masuda*. First, a “layer” and a “surface” are two quite different features, as a “layer” necessarily requires a thickness, while a “surface” does not. Further, even if the upper surface 3c could be considered a “layer,” it is not a discrete portion identifiably different from light guide 3 of *Masuda*. In fact, Appellants respectfully submit that the only reasonable interpretation of *Masuda* is that light guide 3 corresponds to the recited “optical path control layer,” and that (as discussed above) glass substrate 5a corresponds to the recited “visual side substrate.”

Thus, Applicants respectfully submit that independent claim 1 is patentable over the applied references. Further, Applicants respectfully submit that rejected dependent claims 2-19 are allowable at least by virtue of their dependency.

New Claims

Claims 20-44 are hereby added. Claim 20 is similar to claim 1, but recites the features of the invention in different language. Claims 21-40 are similar to claims 1-20, but recite the features of the invention in further different language. Claims 20-40 are fully supported *at least* by FIGS. 1 and 2 of the instant Application, and are respectfully submitted to be patentable over the applied references by virtue of the features recited therein.

Claims 41-44 specify the location of the illuminator, are fully supported by FIGS. 1 and 2 of the instant Application, and are respectfully submitted to be patentable over the applied references by virtue of the features recited therein.

Conclusion

In view of the foregoing, it is respectfully submitted that claims 1-44 are allowable. Thus, it is respectfully submitted that the application now is in condition for allowance with all of the claims 1-44.

If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

Amendment Under 37 C.F.R. § 1.111
US Appln No. 09/851,970

Docket No. Q74435

Please charge any fees which may be required to maintain the pendency of this application, except for the Issue Fee, to our Deposit Account No. 19-4880.

Respectfully submitted,



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CUSTOMER NUMBER

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